MAY 12 1932

SCIENCE NEWS LETTER

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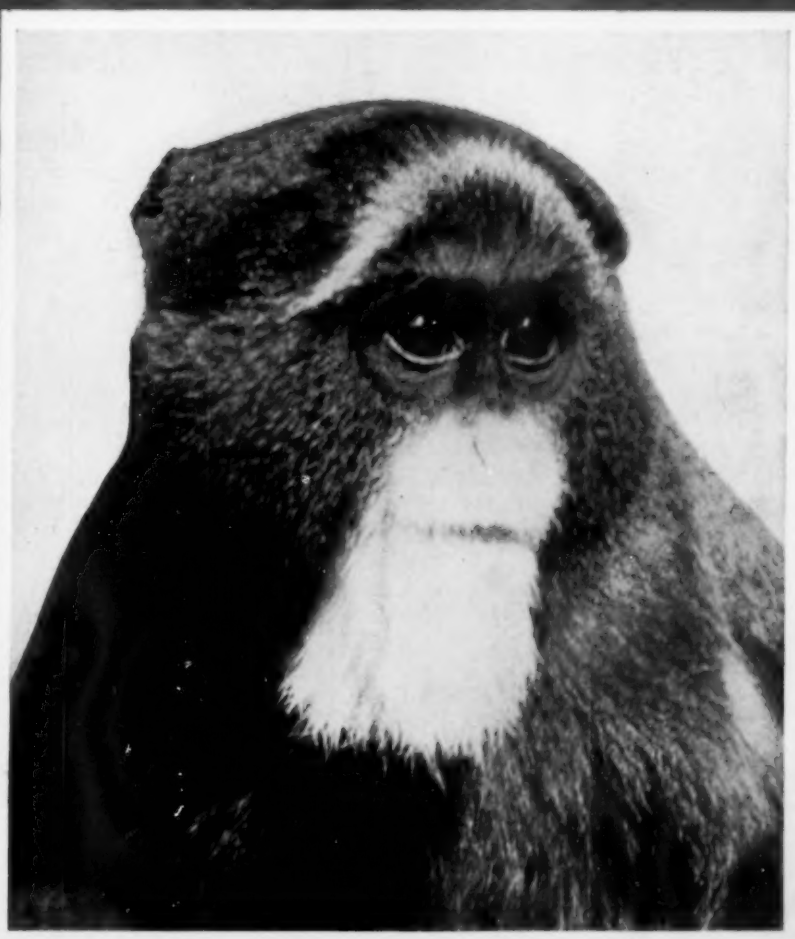
THE WEEKLY SUMMARY OF CURRENT SCIENCE •



MAY 7, 1932

Uncle Silas From the Jungle

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The Weekly Summary of Current Science

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Edited by WATSON DAVIS

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? DO YOU KNOW THAT ?

There are forty large trees at Mount Vernon that are believed to have been there in George Washington's day.

Oranges wrapped in cellophane or aluminum foil keep firm for three to five months of cold storage, while oranges wrapped in paper last less than two months, according to tests made at the Florida Experiment Station.

The United States now has more than half a million acres of orange groves.

Photo-engraving has heretofore been done entirely by hand, but now an automatic device has been designed, to etch and prepare the plates for etching.

Chemists conducting research for a rubber company have discovered a way of eliminating the natural rubber smell from rubber articles intended for personal use.

A museum of costumes, showing the history of dress, is to be established near Paris.

Weasels have often been blamed for killing chickens, when the real slayers were rats, which in turn were being hunted by the weasels.

An expedition is attempting to climb the south peak of Mount McKinley, in Alaska, a goal which has heretofore been attained only once.

Five million million years ago the sun weighed approximately twice as much as it does now.

Cloth, glass, or plaster can be given a metal coating by a new metallizing gun that sprays the melted metal under high pressure.

Motor vehicle registration in the United States dropped off almost three per cent. in 1931, to a total of 25,814,103 cars and trucks.

A physician tells of a mental defective who had so remarkable a memory that he could tell the date of Easter in every year from 1000 to 2000 A.D.

WITH THE SCIENCES THIS WEEK

CURIOSITY-AROUSING questions are prepared concerning the most interesting and important news in each issue. These questions should be a mental stimulant for the adult reader and a boon to the teacher who uses the Science News Letter to add zest to her classroom instruction.

Book reference in italic type is not the source of information of the article, but a reference for further reading on the subject of the article. Books cited can be supplied by Librarian, Science Service, at publisher's price, prepaid in U. S.

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ZOOLOGY
In what habit are raccoons quite unlike monkeys? p. 299

MEDICINE

Mice and Men Collaborate In Defeating Yellow Fever

Researchers at Rockefeller Foundation at Last Develop Method of giving Immunity from This Tropical Scourge

YELLOW fever will claim no more martyrs among scientists seeking to conquer it, and in time it will cease to be a dread peril to missionaries, explorers, business men and the general population in tropical sections of Africa and South America, as a result of the work of a research team of the International Health Division of the Rockefeller Foundation. Immunity can at last be given to protect people against this disease as it is given to protect against smallpox, diphtheria and typhoid fever.

Conquest Only Begun

Announcement of a successful method of protecting against yellow fever was made by Drs. W. A. Sawyer, S. F. Kitchen and Wray Lloyd of the Rockefeller Foundation, at the meeting of the Federation of American Societies for Experimental Biology.

When Walter Reed, aided by brave volunteers who let themselves be bitten by yellow fever infected mosquitoes, proved the role of the mosquito in carrying the disease, it seemed as if the conquest of yellow fever had been made. But it had only been begun. Yellow fever was cleaned out of the United States by warfare against the yellow fever carrying mosquito, and it has been kept out by the vigilance of the Public Health Service's quarantine officers.

It still threatens in other parts of the world, however, and scientists have continued to work for years with the deadly virus or germ that causes it, in the effort to effect its final conquest. Fully as brave as Walter Reed's volunteers are these men who have carried on silently in their laboratories and in the tropics where yellow fever raged. Within the last four years thirty-two of them contracted the disease, five of them dying.

In Dr. Sawyer's own laboratory six members of his staff contracted the fever, but fortunately recovered. From these men he obtained the serum which when injected with yellow fever virus recovered from mice gives immunity to the disease in man.

The work hinges on a discovery of Dr. Max Theiler, formerly of Harvard University. It had never before been possible to give yellow fever to mice, but only to monkeys. Efforts to obtain a strain of the virus from recovered monkeys for immunization purposes were unsuccessful.

Dr. Theiler found that when he injected an irritating substance into the brain of a mouse at the same time that he injected the yellow fever virus, he could produce the disease in the mouse. When Dr. Sawyer heard about this he at once sent for Dr. Theiler to assist with the experiments he was conducting in laboratories provided by the Rockefeller Institute in a desperate effort to find a way of checking the disease that was taking such a dreadful toll of scientists and others.

Yellow fever virus from monkeys that have had the disease is too virulent to be used for immunization, but the mouse virus has been successfully weakened by passing it through two hundred mice. This weakened serum is then given together (*Please turn page*)

UGLIER THAN BIG

Like some nightmare creature of the earlier Wellsian imagination, this rhinoceros iguana in the New York Zoological Park seems—until one learns that he isn't nearly so big as he is ugly. He is as much smaller than a man as a dinosaur would have been bigger than a man—had there been any human beings on earth in those long-gone Days of Dragons.

GEOLOGY

Tiltmeters Make Possible Prediction of Earthquakes

EARTHQUAKES may be predicted, subterranean movement of lava before volcanic eruptions detected, and other small but important shifts in the earth's surface observed by means of delicate instruments known as tiltmeters. The varied usefulnesses of tiltmeters were outlined before the meeting of the American Geophysical Union by George E. Merritt of the U. S. Bureau of Standards.

Tiltmeters are built in several different patterns, but all types of the instrument depend on one of two general principles. Either they measure the tilting of the earth's surface by the change in position of a delicately balanced pendulum, or they make use of the "interference" of light reflected from two nearly parallel surfaces, one of which is a liquid which naturally maintains a horizontal position in response to the pull of gravity, while the other surface is secured to the rock whose movement is to be measured and shifts with it. The "interference" method permits the construction of more rugged instruments, and also their operation at the bottom of deep, narrow pits and in other awkward places where pendulum tiltmeters would be harder to handle.

Tiltmeters may have considerable application in the measurement of movements in floors, pavements, piers and similar structures where only a small change in position can be tolerated.

with serum from patients recovered from yellow fever. The two together give protection against the disease. The six members of Dr. Sawyer's staff who had contracted yellow fever in the course of their work furnished the serum for the first immunization, but Dr. Sawyer finds that it is possible to use serum from the immunized persons also.

It is now ten months since the first human beings were immunized in this way. By tests of their serum on mice, Dr. Sawyer finds that they still are immune. He has been able to test the serum of one of the original Walter Reed volunteers, and finds him also still immune, after thirty years.

The Rockefeller research team hopes that the immunity they are now giving will be equally lasting. It takes about seven to twenty-one days for the immunization to become effective, they find. At the end of a year, they plan to re-test the sixteen persons immunized in their laboratories to see how much protection they will still have against the disease.

Sealed in glass tubes and frozen, some of the immunizing material was sent to Nigeria, in Africa, and to Brazil, where it was used successfully to immunize three other men. As yet not enough material has been produced to immunize large groups of population, but some is already available for scientists, explorers, educators, missionaries, etc., going to yellow fever countries.

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ASTROPHYSICS

Cosmic Rays Detected Having Highest Energy Ever Observed

RADIATION from the depths of the cosmos with the greatest energy ever observed by man has been detected at the California Institute of Technology, Pasadena, by experiments performed by Dr. Carl D. Anderson under the direction of Dr. Robert A. Millikan, Nobel prize physicist.

With energies four hundred times that of the most intense gamma rays from radium and four thousand times that of the most penetrating X-rays used in cancer treatment, these cosmic rays of terrific smashing power are shown to rate a thousand million volts. There are no energies from processes taking place on earth that are more than eight million volts and no higher measurements had heretofore been made. These are from radioactive disintegration.

So large are these energies shown by about ten per cent. of the cosmic rays caught photographically in a new giant ray track chamber, that Dr. Millikan has added two possible hypotheses to his previous suggestions as to the cause of some cosmic rays. The apparent energies in a few of these rays are such as would be expected from the entire annihilation of a proton, the positive unit of matter, in the outer parts of the universe. Or equally well they may be signals of the synthesis of heavy elements of over atomic weight 100 out of hydrogen in distant cosmic spaces. If the latter idea proves correct, it means that silver, gold and other heavy elements are much more plentiful in the rest of the universe than they happen to be here on earth. A thousand million volts is just about the energy that would be given off if silver were synthesized out of hydrogen.

In making the first direct measurements of energies of cosmic rays Drs. Millikan and Anderson were searching for evidence of the nature of this penetrating radiation that has puzzled scientists for the last seven years.

The question was: Are cosmic rays electro-magnetic waves, photons, or ether vibrations like light, X-rays and gamma rays, or are they neutron particles of high speed and energy, such as were suggested as a possibility in Europe recently?

By building a large "cloud chamber" in which cosmic rays rushing through moisture-charged air or gas leave a visible track of tiny water droplets and by subjecting the chamber to an immense magnetic field that bends the cosmic rays, Drs. Millikan and Anderson have obtained evidence that the photon hypothesis best explains the cosmic rays and that they are probably of the same family as light and X-rays. No evidence for the neutron hypothesis was found.

A thousand photographs made with the apparatus secured the portraits of 34 cosmic ray tracks, with curvatures under the influence of the magnetic field that are less as the energy increases.

In his report to the National Academy of Sciences, Dr. Millikan said that the facts indicate that the cosmic rays are absorbed principally by the heart or nucleus of the atoms they hit rather than by the electrons that circle about the heart of the atom. His photographs show cosmic rays that hit an atom releasing two other tracks, one negative and the other positive, indicating both positive and negative particles are sometimes thrown out of the nucleus when it is disintegrated. The photon hypothesis is upheld by the fact that the cosmic rays also hit electrons and act in the same manner as gamma rays, producing the well-known Compton effect, and give more energy than a neutron can.

Nine out of ten of the cosmic rays entering the detecting apparatus have energy values corresponding to those to be expected from the hypothesis advanced by Dr. Millikan several years ago that they originate in the building of the more abundant elements in the depths of the universe. The cosmic birth cries of helium-atom building would be only 27 million volts and would therefore be absorbed by the atmosphere of the earth and not reach the cosmic ray detector at Pasadena. But 116 million volt rays corresponding to oxygen-building, 216 million volt rays corresponding to silicon-building, and 500 million volts corresponding to iron-building are detected.

These researches by Drs. Millikan and Anderson were carried on under the support of the Carnegie Corporation.

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GEOLOGY

Low-Lying Bahama Islands Were Once Mountainous

THE NOW low-lying Bahamas have a lost history of mountainous existence, Prof. Richard M. Field of Princeton University told the National Academy of Sciences.

Data indicating this ancient story of the British islands off the Florida coast resulted from the submarine researches conducted in West Indian waters last winter, in which a major role was played by a delicate pendulum which "feels" out the differences in the rocks due to their varying gravitational attraction. The islands were apparently once a large, continuous land mass.

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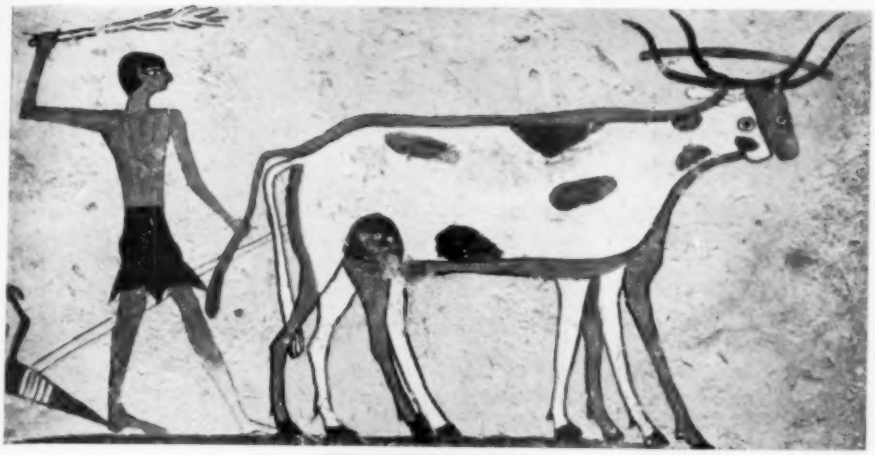

SCRAMBLED LEGS

—showing how a country painter made an anatomical error in Egypt 4,000 years ago

ARCHAEOLOGY

Many Sculptured Monuments In Ruins of Huge Mayan City

Calakmul, in Southern Yucatan, Ranked as One of Most Important Discoveries Ever Made in Mayan Archaeology

DISCOVERY of a new ruined city of enormous area, containing more sculptured monuments than any city of the Mayan Empire ever explored by adventurous white men, is announced by the Carnegie Institution of Washington.

The ruins, difficult of access, stand in southern Yucatan, in the southeast corner of Campeche. Over this region Col. and Mrs. Charles A. Lindbergh and Dr. A. V. Kidder of the Carnegie Institution flew on their air survey in 1929.

Report Heard

A report that a great unknown Mayan city stood in this region came to Dr. John C. Merriam, president of the Carnegie Institution, as he was sailing back to the United States following a recent trip to Yucatan. From a representative of the American Chicle Development Company he learned that one of their men, C. L. Lundell, a young botanist, had come upon ruins which he named Calakmul, meaning in Mayan, "The Two Adjacent Hills." Lundell spent four days examining the ruins and reported finding many sculptured monuments.

So remarkable did the discovery sound, Dr. Sylvanus Morley of the Carnegie Institution arranged with Mexican government officials to visit the site and study it in detail. With a party of five, Dr. Morley journeyed to the place where the ruins were said to be and spent two weeks mapping the sculptured monuments and buildings and deciphering some of the dates on the stones.

In confirming Mr. Lundell's report of discovery, Dr. Morley said: "Calakmul exceeds our expectations. It contains the tremendous total of one hundred three stelae with sculptured figures and hieroglyphs, many more sculptured monuments than any Mayan city hitherto known. Some of the stelae are of high aesthetic merit while fifty-one are dated, of which the expedition deciphered about half."

That the discovery of the new Mayan city ranks as one of the most important ever made in the Mayan field is the view of Dr. Kidder, who is chairman of the Institution's Division of Historical Research. Calakmul was obviously a very great religious center in its day, and therefore, a place of outstanding importance in the Old Mayan Empire. The many recorded dates, sculptured in hieroglyphics on stone markers, or stelae, will give science many new clues to the early empire history of the Mayan Indians.

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ARCHAEOLOGY

Fitting 8 Legs to 2 Cows Baffled Egyptian Artist

A PAINTING of two cows by an Egyptian artist who became completely baffled by the hard problem of attaching eight legs to two bodies has been found in a tomb 4,000 years old.

The amusing picture of the cows with ill-assorted legs is one of the series of amateurish paintings found in a tomb at Thebes by the Egyptian Expedition of the Metropolitan Museum of Art. The tomb belonged to an Egyptian named Djar, who held the post of Custodian of the King's Harim. Considering that Djar must have been a man of wealth, and that he built a large tomb, archaeologists are surprised that he engaged a local country painter to decorate the walls.

"The attempt to paint two cows yoked to the plough got the artist completely befuddled," reports H. E. Winlock, Director of the Museum. "He wanted to paint one of them red and one of them black and white, but he got their eight legs mixed up in ridiculous confusion."

In the crude pictures of this tomb, Mr. Winlock says, "we have discovered a very curious document for the history of Egyptian art."

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MEDICINE

Cancer Cells Declared Abnormal From Beginning

CANCER cannot come from normal cells, in the opinion of Dr. Stanley P. Reimann of Lankenau Hospital Research Institute, Philadelphia, who reported the results of his studies to the Federation of American Societies for Experimental Biology.

Dr. Reimann does not agree with cancer students who think that cancer cells start out as normal cells and become madly-multiplying cancer cells later in their lives. He says the cancer cell is different to start with, and based his opinion on investigations of the effect of sulfhydril on normal and cancerous cells. Sulfhydril is the chemical group consisting of one atom of hydrogen and one of sulfur. This group stimulates normal cells to increase their number and at the same time to become more complex and specialized. This means normal cells do the opposite from cancer cells, and hence cancer cannot come from normal cells.

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ANTHROPOLOGY-ZOOLOGY

Monkeys Get Bald Like Men

Patterns in Which Hair Falls Out and Becomes Gray Found to Be Common to All Members of Primate Group

By JANE STAFFORD

IT IS no longer fair to blame your barber or beautician for that bald spot; nor can you lay your gray hairs onto worry over your childen's naughtiness or your broker's shortsightedness.

Getting bald or going gray are just primate traits, like walking on two legs instead of four, according to the latest pronouncement of science. They are merely one more set of characteristics that set you off from the four-legged animals and from the birds, fish and other non-primates.

You share these traits with the other members of the primate group, the monkeys, apes and lemurs. These animals get bald spots on their heads, and their hair and beards turn gray, although no monkey ever read a strip of ticker tape, visited a barber shop or wore a tight hat.

For years parents have been taking children to the zoos especially to see the monkeys, but apparently no one has noticed that some of the monkeys got gray or bald in the same way as did some of the people on the other side of the cages. It remained for an eminent zoologist, Gerrit S. Miller, Jr., curator of the division of mammals at the U. S. National Museum, to look closely at the monkeys, to see the similarity of their hair patterning to that of humans, and from his studies to set at naught all the old theories about graying and thinning locks. He has just announced the results of his studies on this subject in a publication of the Smithsonian Institution at Washington.

Curious Notions

Not only do monkeys, lemurs and apes get gray and bald, but the very shapes of their bald spots and the places where the first thin spots or gray patches show are the same as in men and women, he found.

You probably have your own notions about why hair grows as it does—why men have beards and women do not, or why hair grows on some parts of the body and not others, or what causes baldness or grayness. Mr. Miller discussed in his report some of the popular theories on this subject. Most of them, he found, have one quality in common. They are all based on the assumption that the peculiarities of human hair are due to man's special constitution or its reaction to its environment and to the developments of civilization.

"It has, for instance, been urged that the general bareness of the human skin comes from the widely prevalent habit of wearing clothes," he said; "that baldness comes from barbers and tight-fitting hats; that women have less baldness than men because women have for centuries taken better care of their scalps than men have; that graying hair is the result of a lessening bodily energy supposed to go with increasing civilization or domestication; that eyebrows exist for the purpose of keeping sweat from running down into the eyes; that men are bearded to protect their throats from cold weather; that women are beardless because they look better that way. All of which gives evidence of ingenuity if of nothing else.

"But not one of the explanations that I have been able to find in print," he continued, "has taken into consideration the zoological possibility that many features of the human hair system may be generalized primate traits instead of specifically human developments. By this I mean the possibility that they may be characteristics that are forced on man because they are common property of the Primates, the animal group to which man pertains. Their explanation, in that event, would have to be made less in terms of human activities and requirements than in terms of the great heritage of characteristics that man shares with all his primate relatives."

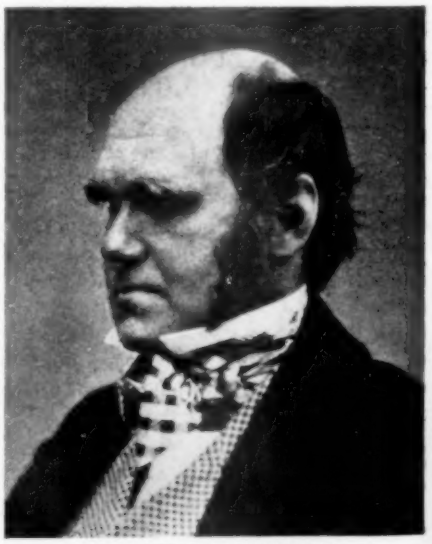
So it all boils down to the fact that your getting gray or bald or both is the result of your belonging to the primate group, and not of any one specific factor in your life or any one thing you do. The actual mechanism of the body processes involved in baldness and grayness, however, has not yet been completely disclosed by scientific research. The endocrine glands may be involved.

Working on this theory, an investigator at the University of Illinois School of Medicine, Dr. Bengt Norman Bengtson, has developed a glandular extract with which he has had spectacular success in growing hair on bald heads. Dr. Bengtson knew that scanty hair was one symptom of disorder of the pituitary gland. When patients suffering from this condition were given pituitary extract, their hair became thicker and more luxuriant at the same time that other symptoms disappeared.

Dr. Bengtson first started working with bald people whom he suspected had some disturbance of the pituitary gland, although their symptoms were slight, perhaps because the glandular disturbance was slight. He gave these patients small doses of pituitary gland extract. To his and their delight, new hair grew on the bald heads, of both better quality and darker color than the scanty locks that had been there before.

More Than One Extract

In some cases Dr. Bengtson used a preparation of more than one glandular extract, according to the indications of glandular disturbance that he found on examining the patients. His method is apparently successful with the class of people suffering from glandular disturbance to which their baldness may be attributed. Whether it will be equally



EVIDENCE HIMSELF

Charles Darwin, the evolutionist, would have been glad to learn that a duplicate of his own bald pate could be found on the monkeys which he declared share with man a common ancestry.

BROTHERS UNDER THE HAT

This South American monkey has the bald area on top with a fringe of hair around the sides, a condition known to many human heads, Darwin's included.

successful on all cases of baldness is not yet known and depends on whether the underlying process by which this primate characteristic is set in operation is influenced by the glands of internal secretion.

Dr. Bengtson himself warns that one should not be too optimistic about the new baldness "cure." He has also been obliged to issue a general warning against preparations reputed to be the same as his but given out by others. He has no associates, and he does not give any treatments or extract except at the University of Illinois School of Medicine in Chicago, he recently stated.

No Cure Revealed

Mr. Miller's studies do not reveal a cause of baldness or gray hair on which a "cure" can be based. Obviously, there is nothing you can do to change this tendency which is a fundamental zoological trait, any more than you can develop forelegs instead of arms and go about on all fours, as do some of the non-primate mammals. If you are sufficiently philosophical, however, you may find consolation for your baldness or grayness in Mr. Miller's findings.

For example, the young woman who sees in her fast-graying hair nothing but the unwelcome sign of advancing age, may pride herself instead on the fact that she may really be several steps farther ahead on the evolutionary scale than her dark-haired sisters. In future generations of the race of man white may be the normal color of the hair at all ages.

"The strong tendency present in the 'white race' of man for the hair to lose its color at an early age may be part of a racial process of depigmentation that has already almost whitened the skin and that may be destined, in the future, to bring about permanent whitening of the hair as well," said Mr. Miller.

The prospect of a white-haired race is not so unpleasing or strange as you may first think. Consider the vogue, in Colonial days, for white-powdered wigs for men and women of all ages, and the present popularity of the platinum blonde.

Complete Whiteness

The process of graying often but not always ends in a stage of complete whiteness, Mr. Miller pointed out.

"But even when a human being has turned gray over the entire body or even has lost all hair color he has done nothing that is essentially new or peculiar for a primate. Light gray or nearly white species of primates have arisen in both Asia and South America."

These animals, he goes on to explain, are not albinos, nor in any way abnormal individuals. Their near relatives living in the same regions are richly colored. Nor is there anything to indicate that either light or dark has any advantage over the other.

"General graying and whitening in man seems likely to be nothing more than another example of human submission to a rule that some other primates have followed," he concluded.

You have undoubtedly noticed how baldness and grayness follow definite patterns. Some men lose their hair in spots above the temples, where, as the hair recedes, the forehead extends higher in two blunt wedges. Or the hair line may gradually get higher and higher all across the forehead. Other men, and women too, develop round bald spots right on the top of the head.

The same is true of graying. Some persons develop gray patches above the temples, which, according to the novelists, give an air of distinction to a man. Others have one streak of gray hair in a dark head. This has been popularly believed to be caused by a sudden fright, although there is no scientific basis for such a theory. In fact, men go gray according to more than eight definitely marked patterns, Mr. Miller has found. Counterparts of these grayness and baldness patterns may be seen in various of man's kindred of the trees.

The uniform raising of the forehead line can be found as in the bald chimpanzee, said Mr. Miller. It is exactly paralleled by the pattern of short and long hairs on the head of one South American monkey, and by the color pattern of another.

The development of the two blunt wedges above the temples results in a pattern much like the one present in a black ape from the island of Celebes. The bald spot on the top of the crown is occasionally seen in the species of monkey known as the toque macaque. A completely bald head as seen in man finds its counterpart in a South American monkey. This animal has long dark hair at the sides and back, just as the entirely bald man generally has a fringe of hair around the sides and back. The monkey has on the top of his head an area of light hair which is so short and sparse that it does not cover the scalp and corresponds closely to the bald area on the human head.

The graying about the temples is a common feature of primate coloring pattern, Mr. Miller found. It is particularly well developed in the gelada baboon. White locks on or near the forehead may be seen in both men and monkeys.

Beards on men usually turn gray before the hair on the scalp. This same pattern may be seen in many species of monkeys, such as the individual shown on the front cover of this week's SCIENCE NEWS LETTER. Another pattern that is surprisingly common in both monkeys and man is a dark line at the cheek-margin of a gray beard.

Eyebrows Human

One hair pattern which is distinctly characteristic of humans is the eyebrow.

"Nothing like the human eyebrows is known in other primates," said Mr. Miller, "but the brow region is one where patterns are made in great profusion."

Another rather characteristically human hair pattern is the development of the moustache. A bare or nearly bare condition of the mouth area is usual among non-human primates, though it is not universal. Beards like those of the human male occur in at least three species of non-human primates, but moustaches are not common. One South American monkey, however, goes far to make up for this deficiency and has a long curling moustache that would have done credit to an Hungarian hussar.

GENETICS-PHYSICS

Size of Gene, Heredity Unit, Determined by X-Rays

THE SIZE of the gene, the unit of living substance that transmits an hereditary character, has been more accurately determined by Prof. Oswald Blackwood of the University of Pittsburgh, who reported the results of his researches before the meeting of the American Physical Society.

Prof. Blackwood's measurement of the gene was done indirectly, by means of a study of the amount of X-ray energy necessary to cause a permanent change, or mutation, by the bombardment of the genes in the germ-cells of a tiny insect, the fruit fly. Several years ago Prof. H. J. Muller of the University of Texas showed that these hereditary changes can be produced by this means, and since then other scientists have been carrying the study forward and refining the technique.

The new diameter of the gene, as now determined by Prof. Blackwood, is 80 Angstrom units; in more familiar measurement, 32 billionths of an inch.

Prof. Edgar Altenberg of Rice Institute, has recently shown that ultraviolet radiation is also capable of causing these hereditary changes, but it is much less efficient than X-rays. The "softest" ultraviolet rays that can produce mutations, Prof. Blackwood believes, are much larger than the genes, having wave-lengths between sixty and eighty times their diameter.

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MEDICINE

Drug Cure Unconfirmed By Health Service Study

PRELIMINARY studies which the U. S. Public Health Service has made of the sodium rhodanate treatment for drug addiction, which Prof. Wilder D. Bancroft of Cornell University reported to the National Academy of Sciences as a "cure" for the condition, fail to confirm the claims of the Cornell University investigators, it has become known.

The U. S. Public Health Service has investigated the new treatment in about 20 cases at Fort Leavenworth station which it is maintaining for the study of drug addiction in cooperation with the Department of Justice.

"Our experience there is not quite in keeping with Dr. Bancroft's," said Dr. W. L. Treadway, of the U. S. Public Health Service, who is directing the drug addiction studies.

Dr. Treadway explained that because of the many factors entering into the problem of drug addiction and its extreme complexity, he believed any new treatment, such as Dr. Bancroft's, must take into account the necessity for more accurate knowledge concerning the chemistry of the opium alkaloids; more reliable information as to their effect on the human body and the exact nature of addiction; together with a satisfactory evaluation of the many psychobiological factors involving addiction about which we talk glibly but have little accurate, concrete knowledge.

"So far as we know there is no treatment for drug addiction from the standpoint of a specific cure that will miraculously operate to rid the drug addicts of their addiction," he said.

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BIOCHEMISTRY

Hungarians Identify New Acid with Vitamin C

THE ANTI-SCURVY vitamin C is the newly-discovered hexuronic acid, it appears from experiments reported by Drs. J. L. Svirbely and A. Szent-Györgyi of the University Szeged, Hungary, to *Nature*. Experiments are now being carried on to determine this fact definitely.

In an earlier study guinea pigs remained free from scurvy for 56 days when the only scurvy-preventive they received was a minute amount of hexuronic acid. The experiments are being repeated with a larger number of animals and a more satisfactory basal diet in order to confirm or to disprove the first results.

Hexuronic acid was discovered and isolated in 1927 by Dr. Szent-Györgyi while working at the Biochemical Laboratory, Cambridge. This acid is found in pretty much the same vegetables and fruits as vitamin C and its chemical properties agree closely with those known for the vitamin. The acid is also found in rather high concentration in the cortex of the suprarenal glands.

Drs. C. G. King and W. A. Waugh of the University of Pittsburgh in the United States recently reported that they had found vitamin C crystallized from lemon juice to be hexuronic acid. Their report appeared in *Science* just two weeks before the Hungarian report was published.

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IN SCIENC

PHYSICS

Physicist Investigates Bursting Sodawater Bubble

WHEN a glass of sodawater fizzes, each bubble of gas in bursting at the surface of the liquid throws out droplets the greatest range of which is 5½ inches.

This was determined by Dr. Otto Stuhlman, Jr., physicist of the University of North Carolina, in a study of the mechanics of effervescence reported to the American Physical Society.

In water the bubbles rising from the depths of a glass, for instance, at ordinary room temperature of 70 degrees Fahrenheit usually grow to a diameter of about a twentieth of an inch before they explode and eject many small drops of the water. Each burst is accompanied by the simultaneous ejection of as many as five drops.

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MEDICINE-PHYSICS

Curative Effect of X-Ray Dependent on Wavelength

NEW TESTS that may have important applications in medicine's attack upon cancer by X-rays and radium have been presented by Dr. G. Failla of Memorial Hospital, New York City, to the American Physical Society.

X-rays from the large 700,000-volt tube recently installed at Memorial Hospital, X-rays from ordinary 200,000-volt tubes such as used in cancer treatment and gamma rays from radium do not have the same effects on human skin and other living tissue, investigators at the hospital have found.

Dr. Failla, reporting on behalf of different scientists engaged in the research, explained that the wavelength of the radiation plays an important part in the degree of effect produced, and that from a practical standpoint human patients and other living things do not react in the same way to the three qualities of radiation. These observations are expected to have direct application to the use of these radiations in the treatment of cancer.

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NCE FIELDS

ASTRONOMY

Reinmuth Object and New Comet Sighted During Week

AN OBJECT new to the heavens, the second within a week, was discovered at Heidelberg Observatory by Dr. Karl Reinmuth, astronomer, and observed also by his colleague, Dr. M. Muendler, the International Astronomical Bureau has been informed. The newly found Reinmuth object may be an asteroid or a comet. The Carrasco comet observed at Heidelberg on April 25 is definitely a comet. Both are twelfth magnitude and too faint to be seen without a telescope.

The Reinmuth object was located in the southeastern evening sky a little east of the bright star Spica in the constellation of Virgo. Its astronomical coordinates when observed April 27 were right ascension 13 hours 42 minutes 7.8 seconds and south declination 10 degrees 41 seconds and 52 minutes.

The Carrasco comet has been located not only by Heidelberg observatory, but also by the U. S. Naval Observatory and on the Harvard College Observatory photographs.

Dr. Muendler's observation showed the Carrasco comet to be twelfth magnitude with a right ascension of 12 hours, 8 minutes, 17 seconds and a declination north 23 degrees, 46 minutes, 13 seconds, on April 25 at 20 hours 43.3 minutes Greenwich civil time. It has a small daily motion in the heavens.

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CARTOGRAPHY

Air Mapping Made More Accurate by Mathematics

ARTILLERISTS in charge of long-range guns in war, and peacetime surveyors with impossibly rough terrain to map out, can profit alike by a new mathematical method for evaluating airplane photographs worked out by Prof. Earl Church of Syracuse University. Prof. Church described his new method at the meeting of the American Geophysical Union.

At present the most practical method whereby an object in airplane photographs can be accurately located both in horizontal position and in altitude above sea level is by the use of complicated and highly expensive stereoscopic instruments of European manufacture, only a few of which are in this country. Prof. Church's method eliminates the use of such costly and difficult apparatus, and substitutes measurements with a simple instrument called a "comparator," in the initial steps of the problem. After that the whole operation is carried out mathematically. The formulae are somewhat laborious, but most of the work can be done with calculating machines.

It is necessary to have three known points accurately located in the first photograph. But after that, points located through reference to them can be used as initial points in the calculation of new locations.

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PHYSIOLOGY

Tests Show Coffee Only Brief Aid to Wakefulness

THOSE who drink coffee in order to to keep awake must drink a cup every hour or so, or the wakefulness they seek will wear off, according to results of experiments at Cornell University by Prof. A. L. Winsor and E. I. Strongin, under a grant of the Heckscher Foundation for the Advancement of Research.

Coffee is found to stimulate the production of digestive juices in one who drinks it occasionally. These effects are found to diminish as a tolerance to the drug caffeine which coffee contains is developed.

Prof. Winsor's research is said to prove what has long been suspected, namely, that the human body can create a tolerance to caffeine through continued use. It also tends to disprove the popular belief that coffee's effects last for six or seven hours, keeping a person awake "all night."

The experimenters measured the effects of caffeine on the human system by studying secretion of the salivary glands in the mouth, and by this method were able to check their results. They found that a period of about fifteen minutes occurs immediately upon drinking the beverage, during which the system remains passive. This is followed by the indirect effects, when secretions are increased 100 to 200 per cent.

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MEDICINE

Iron Salt Prolongs Life Of Tuberculous Animals

ANIMALS suffering from tuberculosis gain in weight and live longer when given injections of iron in the shape of ferric chloride, Dr. Valy Menkin of Harvard Medical School, reported to the meeting of the American Association of Pathologists and Bacteriologists. So far, his studies have only been carried on in animals and there has not yet been any application of the work to humans suffering from tuberculosis. Dr. Menkin had previously discovered that when this iron salt is injected into the veins of tuberculous animals, the iron accumulates in the tuberculous areas, and he wondered what effect this would have on the course of the disease.

He found that the iron injections retarded the development of the tuberculous changes and that while the animals died eventually of tuberculosis, they lived longer than tuberculous animals which did not receive the iron injections. Furthermore, there was less tuberculous involvement in the lungs of animals receiving the iron injections.

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ARCHAEOLOGY

Monte Alban Treasure Thought Unique Discovery

LITTLE hope that the recent treasure tomb discovery at Monte Alban will be followed by a series of similar revelations of Mexican gold and jewels is held out by Mrs. Nuttall, American archaeologist resident at Mexico City.

The Monte Alban treasure is a fortunate discovery which may never be repeated, Mrs. Nuttall declares. There is much historical evidence that, in the days of Spanish Conquest in Mexico, the Spaniards forced and bribed Indians to open their ancestors' tombs. Systematic looting of Indian graves was the rule after the Spanish Conquest. The Spanish king granted concessions for the exploiting of native tombs in Mexico, and levied taxes on their yield.

An idea of the quantities of gold salvaged from Indian tombs is given by the chronicler Bernal Diaz in one incident. He told of a hurricane at Vera Cruz in the year 1529, in which 100,000 pesos of funeral gold were sunk.

Some of the churches built in Mexico by Spanish missionaries were financed by gold from the native tombs.

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PHYSICS

Medical Research Aided By Genius of Col. Lindbergh

THE MECHANICAL genius of Col. Charles A. Lindbergh has been enlisted in the Rockefeller Institute for Medical Research investigations, one of which is the problem of keeping portions of the animal body living indefinitely in a test tube.

As the result of months of work in the famous laboratory of Dr. Alexis Carrel, Col. Lindbergh has devised a new apparatus for washing red blood corpuscles, an operation that physiologists and bacteriologists must perform many times each day. Scientists who have studied the brief report and sketch of the centrifuge designed by Col. Lindbergh are of the opinion that the new apparatus and technique will find immediate practical use in laboratories.

The kidnaping of the Lindbergh baby rudely interrupted Col. Lindbergh's collaboration with the Nobel prizeman, Dr. Carrel, who is famous all over the world for his tissue culture work. Although Col. Lindbergh's modest report was not published in *Science* until April, it was prepared in February before the kidnaping and it is understood that Col. Lindbergh had begun work on another problem.

The Lindbergh centrifuge for washing red blood cells is a conical glass vessel which is whirled rapidly so that force upon the blood within it is 650 times that of gravity. Leading into the conical glass chamber is a glass tube connected to a reservoir of liquid to be used in washing the red blood cells. This apparatus allows the blood cells to be washed free of blood plasma at the same time that they are separated from the rest of the blood. A test made by Col. Lindbergh showed that in 15 minutes all but a fraction of one per cent. of the original fluid was removed by the washing process.

The conventional method of performing the same operation in the laboratory is separating the corpuscles by centrifuging and then washing them as a separate operation. Col. Lindbergh does both at the same time.

Col. Lindbergh's investigations at the Rockefeller Institute were kept secret until the publication of his report. Dr. Carrel when questioned on the rumors that he had Col. Lindbergh for a collaborator would neither deny nor confirm the report, but said:

"While publicity about scientific discoveries is useful, publicity about the men who are expected to make these discoveries is just the opposite. Intellectual creation requires solitude and silence. If any celebrated man wishes to give research the aid of his imagination or technical ability, he should be entitled to the same privileges as any scientific worker."

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BACTERIOLOGY

Bacteriophage Used In Treating Blood-Poisoning

THE ALMOST hopeless outlook in one of the commoner kinds of blood-poisoning has been considerably brightened as a result of a new type of treatment using the bacteriophage or bacteria-eater, Dr. W. J. MacNeal and Dr. Frances C. Frisbee of the New York Post-Graduate Medical School and Hospital reported to the joint meeting of the American Association of Pathologists and Bacteriologists and the American Association of Immunologists.

A bacteriophage able to destroy the staphylococcus germs found in the circulating blood in this type of blood-poisoning was used to treat patients suffering from this usually fatal disease. Out of a series of fifteen patients, eight died and seven recovered.

"There is reason to expect even further improvement in the death rate as greater skill is acquired in the use of this newer agent," Dr. MacNeal said.

The bacteriophage preparation in this series of cases was applied to open wounds and was injected into the tissues under the skin and into the circulating blood.

"Although the bacteriophage may completely destroy the bacteria in the test tube," said Dr. MacNeal, "it evidently is far less effective in the living tissues. Its successful use requires great care and the course of the disease eventually leading to recovery is prolonged and beset with many dangers."

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ASTRONOMY-METEOROLOGY

Shooting Star Trails Show Direction of Upper Air Winds

BRIGHT trails of meteors, or "shooting stars" tell scientists the direction and speed of winds in the high atmosphere, miles above the earth. Data thus obtained are valuable in the understanding of the behavior of radio waves and for our control over them.

At the meeting of the American Geophysical Union in Washington, Dr. E. O. Hulburt of the U. S. Naval Research Laboratory summarized what has been done to date and pointed out how amateur star watchers as well as professional astronomers can help in filling the gaps that still exist in our knowledge of these phenomena.

All the observations thus far on record were obtained in North America and Europe, plus a few made on shipboard on the North Atlantic. They indicate in general that the winds at levels from somewhat under twenty to about fifty miles blow toward the west during daylight hours at least. Meteor trains observed at night were at higher levels—fifty to eighty miles up—and showed winds blowing in the opposite direction.

Not all the trains drifted in the "orthodox" directions, however; some were observed at various levels that indicated cross-currents, eddies or calms.

The total number of accurately observed meteor trains is still small, Dr. Hulburt said, because relatively few observers have taken the trouble to make even moderately accurate records of them. Elaborate equipment is not necessary, however, for obtaining data of this kind, that may prove invaluable to radio and other lines of scientific work. A small telescope, equipped with graduated scales to give celestial latitude and longitude, and capable of quick maneuvering, is all that is required.

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ANIMAL PATHOLOGY

Foot and Mouth Disease Fought In New California Outbreak

WAR against an invader, no less deadly and relentless than it would be if the invader were a hostile foreign nation, has broken out in southern California. The first battle has been won by forces of the U. S. Department of Agriculture and the State of California, in the mass slaughter of 5,000 hogs, in two herds at Guena Park, Orange County, known to be infected with foot and mouth disease or to have been exposed to it. The luckless squealing animals were driven into great trenches dug to receive them, shot down to the last pig, covered with quicklime and buried. No cure is known for foot and mouth disease, and it spreads like wildfire among any kind of hoofed animals; so immediate massacre and quick burial constitute the only possible treatment.

Several times have different parts of the United States been threatened with this disease, which attacks human beings as well as livestock, and which is widespread in Europe, South America and other parts of the earth. Each time it has been stamped out by the same Spartan methods of mass killing and rigid quarantine of the areas known to contain the infected soil—for the virus lives for some time on the surface of the ground.

The general in charge of the Federal forces in California is Dr. Rudolph Snyder, of the Department of Agriculture, who was in Texas when the outbreak was discovered and flew to the fighting front by airplane. In charge of the California forces is Dr. J. J. King, State veterinarian. The invasion was first discovered by Dr. L. M. Hurt, who notified State and Federal authorities. Positive diagnosis of foot and mouth disease was made by Dr. Jacob Traum of the University of California.

In the background, in Washington, stands the chief of the bureau of animal industry of the Department of Agriculture, Dr. John R. Mohler, ready to speed to the assistance of his lieutenant if necessary. He has confidence, however, that Dr. Snyder will have the situation in hand; for Dr. Snyder had charge of the Federal work during the California outbreaks of foot and mouth disease in 1924 and 1929, and therefore rates as a veteran in this kind of warfare. For sinews of war, there remains a sum left over after the 1924 outbreak had been put down, and Dr. Mohler is hopeful that it will suffice for the present emergency.

It is not known how the present invasion broke into the country. It seems probable, however, that it was imported, for Orange County lies on the seacoast, between Los Angeles and San Diego counties, and within easy trucking distance of several seaports. The hogs were known to be garbage-fed; and it was garbage from a coastwise steamer from South America that started the 1929 foot and mouth disease epidemic in California.

One encouraging feature in the present situation is found in the relative isolation of the two infected herds of hogs which have been destroyed. With a strict quarantine in force, it may well be that the first battles will also be the last.

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CHINESE MASTERPIECE FOR CHICAGO FAIR

The beautiful Golden Pavilion of Jehol, finest Lama temple in China, is to be brought to Chicago and re-built on the Lake front for the Century of Progress exposition of 1933. The temple is of teak and other rare woods heavily carved. Its greatest splendor is the roof of gilded copper which is so picturesquely embellished. Jehol, where the temple stood, was the summer home of the Manchu emperors.

Arrangements for erecting the temple are being made by Dr. Sven Hedin, noted Swedish explorer, and his assistant Dr. Gosta Montell, who brought it from China for Vincent Bendix of Chicago. A Chinese architect and skilled Chinese workmen will assist the Chicago contractor who rebuilds the shrine.

In the temple, Dr. Hedin will install many Oriental treasures which he has collected, including Buddhas of bronze and gilt wood, a throne of the Grand Lama, prayer wheels, priestly robes of rich stuffs, masks used in sacred dances, temple bells, parchment writings, and rare wall hangings of painted silk.

PHYSIOLOGY

After-Dinner Thirst Lasts Only Few Hours

EXPLANATION of why you get thirsty right after dinner was given in a report by Dr. Magnus Gregerson of Harvard University Medical School to the Federation of American Societies for Experimental Biology. Right after eating, water is withdrawn from the blood and tissues of the body and used to increase the digestive fluids. This leaves the body in a dried-out condition and makes you feel very thirsty. As digestion progresses, the mixture of food and digestive fluids is absorbed, the water is restored to the blood and tissues, and you gradually lose your thirst. So if you cannot get a drink to quench your after-dinner thirst you may console yourself with the thought that the thirst will diminish within a few hours anyway.

Dr. Gregerson studied after-dinner

thirst in dogs. Under ordinary conditions a dog does almost all of his drinking within two or three hours after eating. During this time there is a marked reduction of the flow of saliva, corresponding roughly to that occurring if the animal does not get any water for 48 hours. But in four or five hours the secretion of saliva returns to normal, even though the dog has had nothing to drink in the meantime.

Furthermore, if the animal is deprived of drink for five or six hours after feeding and then allowed to drink freely, his entire intake of water for the 24 hours is only about one half or one quarter of the amount he usually drinks during 24 hours.

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ASTROPHYSICS-METEOROLOGY

Climatic Cycles May Allow Long-Range Forecasting

Sunspots and Other Phenomena Show Regular Fluctuations Which May Have Practical Significance in Future

CLIMATE here on earth varies in cycles and there is hope that future generations may use the knowledge and records being accumulated by science to predict their weather and climatic environment for long periods in advance.

The National Academy of Sciences devoted one session to reports from the leading investigators of climatic cycles. While they presented evidence from sunspots, tree rings, clay layers, solar radiation and other phenomena showing regular fluctuations, they joined in placing the wide-spread practical application of these methods of prediction some years in the future.

The importance of knowing the regular fluctuation of climate was emphasized by Dr. John C. Merriam, president of the Carnegie Institution of Washington, chairman of the Academy's committee on the subject.

Weather Abnormalities Periodic

Summarizing forty years of study of the sun's radiation, Dr. C. G. Abbot, secretary of the Smithsonian Institution, reported that the sun's output of radiation is variable, that its variation is periodic, that the United States weather departures from normal are periodic, and that nearly all the ranges of weather departures from normal are comprised in a series of periodicities which are identical to those found in the sun.

"We have not yet tried the bold venture of long-range forecasting that might even enable meteorologists to forecast long in advance the fat years and the lean years as Joseph is said to have done in Egypt," Dr. Abbot explained. "We expect to discover by a little more research whether we have real cause and effect in these relationships."

The variations in solar radiation as measured daily from high mountain peaks in this country and South America can be reproduced by seven regular periodicities of 7, 8, 11, 21, 25, 45 and 68 months, Dr. Abbot's studies show.

Dr. Walter S. Adams, director of the Mount Wilson Observatory, upheld the reality of the sunspot cycle of about 11 years but declared the real cycle is from the time the spots are fewest until the sun is again free of spots. This is about 22 years long. The period of any one rise from minimum to maximum may vary from 9 to 14 years and the amplitude of the maxima may vary by 50 per cent. A longer period of 60 to 80 years also has been detected.

"It seems probable that both the quantity and quality of solar radiation vary during the sunspot cycle and many attempts have been made to correlate terrestrial phenomena with sunspots," said Dr. Adams, who has worked in collaboration with Dr. S. B. Nicholson. "Definite correlations have been found with the variations of terrestrial magnetism and its related phenomena. There is evidence of a slight correlation between sunspots and atmospheric temperature in certain regions on the earth and with other factors of weather and climate for limited regions and for limited time intervals. These correlations are so uncertain that, in the majority of cases at least, predictions based on them have very little weight."

Tree rings that record climate variations extending 3,000 years into the past were analyzed by Dr. A. E. Douglass of the University of Arizona. He explained how graphical analysis of the records had shown convincing evidence of the reality of climatic cycles, including one that corresponds to that of the sunspots.

Hope that the layers of clay sediments left by the receding glaciers of Ice Ages may be made to reveal the climates of those ages was expressed by Dr. Isaiah Bowman of the American Geographical Society. As yet these climatic indicators have not yet been tied into the present time or with the tree-ring records. Scientists are now attempting to link these natural records through study of the mud layers left in old lake bottoms in western United States and the trees that grew nearby.

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MEDICINE

Bad Cold May Nullify Liver Treatment in Anemia

WHY the effect of liver in treating pernicious anemia is checked by an acute infection, such as a bad cold or an acute attack of sinus trouble or any other infectious disease, was explained by Dr. Gulli Lindh Muller of the Thorndike Memorial Laboratory, Boston City Hospital and Harvard Medical School, who reported results of his studies to the American Association of Pathologists and Bacteriologists at Philadelphia.

The reason seems to be that acute infection has exactly the opposite effect on blood formation to that of liver or liver extract. The liver stimulates the blood-forming organs to produce new red blood cells. The infection seems to have a restraining effect on the blood-forming organs.

In the first series of patients treated with liver, Drs. Minot and Murphy, first to use the method, noticed that infection checked the response of the blood cells and the general improvement in the patient. Seeking an explanation for this, Dr. Muller studied pigeons, the only animals yet found to be peculiarly sensitive to liver.

Liver extract given to pigeons produces a condition of blood and bone marrow similar to that in pernicious anemia patients after treatment with liver, Dr. Muller explained. An acute infection will inhibit the response to liver treatment in these animals.

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GENERAL SCIENCE

Social Sciences Debated On By Physicist and Economist

Transmission of Scientific News to Public Discussed By Notables at Conference Sponsored by Science Service

ARE the social sciences really sciences? Can economics and the other studies that bear immediately and intimately on human affairs be handled with the same detached objectivity that is possible to a physicist sifting cosmic rays as they dart in from the depths of space, or to a biologist as he pries into the life of a germ or an insect?

This question became the subject of a brief friendly debate between a noted physicist and an equally noted economist at the dinner following a conference called by Science Service to discuss possible improvements in the transmission to the public of scientific news and information.

The question was first raised during the afternoon conference by Robert P. Scripps, editorial director of the Scripps-Howard newspapers, whose father, the late E. W. Scripps, was the founder of Science Service. The ruling idea in his father's mind when he launched the enterprise, Mr. Scripps said, was to benefit humanity by the wider dissemination of scientific knowledge and method; and he suggested, as in line with this tradition, the possible advisability of adding the so-called social sciences to the scope of Science Service's work.

Expressed Doubts

In his evening address, Prof. Robert A. Millikan, director of the Norman Bridge Laboratory of the California Institute of Technology, expressed frank doubts as to whether the social sciences are really scientific. The thing that really characterizes a science, he said, is the existence of a large body of facts, a universally accepted doctrine. A science such as physics, he pointed out, is based on such a body of facts, and though this basis may be added to, the later additions work no essential change in the earlier known truths. There is, of course, always a margin of disagreement, usually over new developments, but as compared with the main body of the science this is very narrow.

In economics and the other social sciences, Dr. Millikan held, an exactly opposite condition obtains. The body of agreed-on doctrine is vanishingly small, and the field in which experts disagree comprises almost the whole of the science. Furthermore, the disagreement extends beyond questions of fact into the lightning-charged field of the emotions and human passions, so that the conflicts arising therein are much more intense than they are in the more academic realm of the physical sciences. For this reason, the speaker concluded, it would seem inadvisable, perhaps dangerous, for an organization like Science Service to undertake an extension of its activities into the social science field at the present time.

Dr. H. G. Moulton, president of the Brookings Institution, Washington, D. C., spoke as an active champion of the social sciences, as having an intimate and potentially useful bearing on human life and as being susceptible to a really scientific approach. Economics was once as definite a science as physics, he said, at least so far as having a definite basis of agreed-on doctrine is concerned. It has only been during the past one or two generations that this apparently solid basis has been dissolved by the revolutionary changes brought about by recent world events. The facts of economics and the other social sciences are still there, he insisted, and still capable of the impartial and objective treatment demanded by true scientific method. He felt that they constitute a challenge to an institution for the popular dissemination of knowledge, like Science Service, and that work in this field would be a quite proper undertaking.

The remaining discussion during the evening session was given an entirely different turn by Dr. John H. Finley, associate editor of the New York *Times*. He spoke of the problem from an editor's angle, stressing the constant necessity of working with speed yet with accuracy, of maintaining a balance of material selected, of watchfulness against propaganda from any source, and of the editor's need to "know a little about everything, and to know where to turn to find out everything about anything."

Dr. William H. Welch of the Johns Hopkins University, "the Dean of American Medicine," presided at the evening meeting.

During the afternoon session, a succession of five-minute talks by various eminent scientists and representatives of the press set forth a symposium of views on the more immediate problems involved in getting correct information on scientific advances and scientific methods before the general public. The conference was held in the building of the National Academy of Sciences, immediately after the close of the spring meeting of the academy, and a majority of the scientists present were members of that organization, often called "the Senate of American Science."

Tribute to Founders

In opening the discussion, Dr. J. McKeen Cattell, editor of *Science* and president of Science Service, paid a tribute to the late E. W. Scripps and to Dr. William E. Ritter of the University of California, as co-founders of Science Service. "If Scripps was the Charlemagne who could do all this with a high hand, Ritter was the Alcuin who advised him," he said.

Then, in rapid succession, the scientists and newspaper men voiced their opinions and suggestions.

Dr. Simon Flexner, director of the Rockefeller Institute for Medical Research, New York City, spoke of the need for more than ordinary precaution in handling medical news, and suggested the advisability of submitting all items to an advisor well qualified in medical science.

Dr. Karl T. Compton, president of the Massachusetts Institute of Technology, expressed the wish that scientific institutions and organizations might "feed in" important and desirable news items, so that they may receive prompt and adequate notice.

Dr. Frank B. Jewett, president of the Bell Telephone Laboratories, spoke on the necessity of informing people not only on new scientific discoveries but on scientific method and outlook as well. The rulers of the world are uninformed of the natural forces that control the world, he said, and much of the present crop of disastrous legislation is such simply because it runs counter to natural laws. If it is to be avoided, and wise laws passed, the lawmakers must be given information.

A. H. Kirchhofer, managing editor of the Buffalo *Evening News*, spoke as

a representative of the press. He asked for more mutual tolerance and patience between scientists and newspapermen, and expressed the belief that news stories on scientific subjects would be more satisfactory both to editors and to scientists if the latter would give intelligent reporters their cooperation.

Dr. John C. Merriam, president of the Carnegie Institution of Washington, after warning newspapermen against trying to make "good copy" and big headlines out of researches still in the discussion stage, concluded with the suggestion that the knowledge of interest by the public in such unfinished problems may stimulate scientists to express their findings more clearly and understandably when they finally reach them.

Dr. A. A. Noyes, director of the Gates Chemical Laboratory of the California Institute of Technology, made two suggestions: first, the desirability of making clear the evidential status of any announcement put forth as a news item; second, the possibility of using younger scientists in the various laboratories and universities as local correspondents.

Concept of Accuracy

Prof. E. B. Wilson of Harvard University School of Public Health called attention to the differing aspects of the concept of accuracy, depending on the audience to whom a given scientific discovery or fact is to be presented. Details that are absolutely essential before a group of scientists may only befog the picture if they are used before a lay audience, and thus destroy instead of making accurate the image that gets into the minds destined to receive it.

Dr. Charles G. Abbot, secretary of the Smithsonian Institution, registered strong approval of a new Science Service enterprise, the distribution of low-priced phonograph records giving brief talks by leading scientists, and expressed the hope that further issues of this sort would be made.

Dr. W. F. G. Swann, director of the Bartol Research Foundation of the Franklin Institute, Philadelphia, voiced his faith in the ability of "the man in the street" to understand science if it is properly presented. He said, "I would much rather talk about relativity to an intelligent lawyer or an intelligent clergyman than to a bad physicist."

Dr. Francis G. Benedict, director of the Nutrition Laboratory of the Carnegie Institution of Washington, in Boston, stressed the desirability of care and accuracy in reporting medical discoveries, because of the great immediate importance of these to human life, and the possible lamentable consequences of even apparently minor error.

Dr. Paul R. Heyl of the U. S. Bureau of Standards suggested that general summaries or reviews of progress in science might be well received, and would be useful to scientists as well as to the lay public.

Dr. A. E. Kennelly of Harvard University called attention to possible errors of impression that readers might receive if undue emphasis is placed on the wrong point in reporting a scientific discovery or event. He also made a plea for the expression of quantitative results in the metric system, "the international language of science."

Prof. Charles R. Stockard of Cornell University Medical College reinforced previously expressed pleas for a high degree of accuracy in reporting medical news. He further suggested the desirability of explaining properly how animal experimentation is used in working out medical advances, as a counter to antivivisection propaganda.

Prof. Joel H. Hildebrand of the University of California expressed his desire that science articles intended for the general public give not merely the news of discoveries but that they also stress the importance of the scientific method in thinking and working.

Dr. T. Wayland Vaughan, director of the Scripps Institution of Oceanography, La Jolla, Calif., declared that his relations with the press had always been satisfactory, because he was willing to meet intelligent newspapermen half way. He recommended cooperation to his fellow-scientists.

Prof. Richard M. Field, Princeton University geologist, called attention to the natural interest of the public in the economic aspects of science, and in economic questions generally.

Dr. F. P. Keppel, president of the Carnegie Corporation of New York, commended Science Service for having "stuck to its last," and said he hoped it would continue to do so.

Dr. F. G. Cottrell, chemist and inventor of the precipitation process, laid fresh emphasis on the necessity of presenting science as news to newspapers.

Capt. J. F. Hellweg, superintendent of the U. S. Naval Observatory, spoke briefly on "what should not be printed."

Prof. Knight Dunlap of the Johns Hopkins University contrasted conditions in science news reporting since Science Service entered the field with what they were before that time, and expressed the hope that this organization would continue its work independently, not only for the work it is doing itself but for its stimulating effect on the science reporting of the other newspaper syndicates.

Dr. W. H. Howell, chairman of the division of medical sciences of the National Research Council and chairman of the executive committee of Science Service, closed the discussion with an expression of thanks to his fellow-scientists for their cooperation in the work of Science Service.

Science News Letter, May 7, 1932

PSYCHOLOGY

Leaders, Criminal or Not, Have Traits in Common

PSYCHOLOGICAL tests indicate that the leader of gangland may owe his supremacy to the very same traits that make another man an officer in the army or a leader in student activities at a university. The tests were given by Dr. W. H. Cowley, of Ohio State University to 20 criminal leaders from the Illinois State Penitentiary at Joliet, Ill.; to 20 criminal followers at the same institution; 20 non-commissioned officers and 20 privates from Fort Sheridan, Ill.; and 16 student leaders and 16 student followers from the University of Chicago.

Certain traits, as revealed by the tests, were found to be held by all three groups of leaders and not by their followers. These are self-confidence, finality of judgment, "drive" or lack of inhibition, and speed of decision.

Science News Letter, May 7, 1932

RADIO

The Science Service radio address next week will be on the subject of

MAKING BACTERIA INVISIBLE AND ITS SIGNIFICANCE

Dr. James P. Simonds

professor of pathology, Northwestern University Medical School, will be the speaker.

FRIDAY, MAY 13

at 2:45 P. M., Eastern Standard Time

Over Stations of

The Columbia Broadcasting System

ZOOLOGY

NATURE RAMBLINGS

by Frank Thone

Raccoon

MOST fathers of modern families think of raccoons in the winter time, when Son's bills come in, swollen unnaturally by the accession of the bulky coat affected by collegiate youth. To such a parent, the raccoon must loom as large and ravenous as a wolf; and any hint that 'coonie is a small, mostly harmless, really attractive animal would bring forth snorts and gnashings.

But it is during the summer that the raccoon makes most of his first-hand acquaintance with the works of man. He prowls about at night, wearing his own coat, seeking what he may devour. When he finds it, in cornfield or truck patch, he seizes upon as much as seems good to him. And in the morning, when the farmer comes forth, there are again snorts and gnashings.

But on the whole, in regions where he has not been allowed to maintain too numerous a progeny, the raccoon does little enough mischief. And the specimens that are captured young enough repay with entertainment as pets whatever damage their parents may have done before them. They have many of the "cute" human-like tricks that make monkeys entertaining, and unlike monkeys they do not have the drawback of looking like malicious caricatures of human beings. And unless they are teased beyond endurance they are docile and affectionate.

In another respect raccoons are quite unlike monkeys. The average monkey would rather go through fire than touch water, but all raccoons are water-lovers. They wash everything they eat, every toy given them to play with—even old Tabby's kittens, if they can lay paws on them. They are apt to be damp at times, but no one can accuse them of being uncleanly.

Science News Letter, May 7, 1932

MEDICINE

Leprosy Germs Grown in Laboratory for First Time

IMPORTANT progress in the fight science is making to conquer leprosy appeared in reports of two studies on the disease made to the American Association of Pathologists and Bacteriologists at their meeting in Philadelphia.

Dr. Earl B. McKinley, dean of the George Washington University Medical School, reported that he and his associate, Dr. Malcolm H. Soule of the University of Michigan, had succeeded in growing 12 generations of the germ of leprosy outside of the human body. Although leprosy has been a disease of world-wide importance for centuries, this is the first time its germ has ever been grown on artificial culture media in the laboratory.

When earlier generations of these germs were injected into monkeys, they produced nodules similar to those seen in early leprosy and to those produced when human leprous material is injected in the monkeys. The germs were cultivated on a special medium having a certain concentration of oxygen and carbon dioxide gases. Germs from the ninth, tenth and eleventh generations, however, did not produce the nodules when injected into older monkeys. This might have been because the monkeys were resistant to the infection or because later generations of the germs had lost their ability to produce the disease, Dr. McKinley commented. He also reported that it was becoming increasingly difficult to keep the germs growing on the artificial medium.

Resemble Tuberculosis Changes

At the same session Dr. H. W. Wade, medical director of the Leonard Wood Memorial at Culion, the leper station in the Philippine Islands, described leprous sores which differ markedly in their cell structure from the ordinary changes of the disease and resemble certain of the changes seen in tuberculosis. These spots are of interest because they may be mistaken for actual tuberculosis changes, especially since leprosy germs are rarely found in them, Dr. Wade pointed out. He suggested that this "tuberculoid" reaction of the tissues to the presence of the leprosy bacillus might be due to a peculiar condition of the tissues in which they had become unusually sensitive to the leprosy germ.

Science News Letter, May 7, 1932

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MAY 9 1932

• First Glances at New Books

Philosophy

WHAT DARE I THINK?—Julian Huxley—*Harper*, 278 p., $2.50. An eminent British biologist and popularizer of his science here sets himself the task of deciding how the insights and power that science have brought us affect the effort to "have life and have it more abundantly." He had originally intended to call the book "Scientific Humanism," but he has not hesitated to include experiences and problems that have come to him outside of his activities as a scientist.

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Botany

A KEY TO THE FAMILIES OF FLOWERING PLANTS — Robert F. Griggs — *Author* (Washington), 32 p., 35c.; in lots of 10 or more, 30c. A second edition of a convenient, pocket-size, compact key to families of flowering plants in the northeastern United States. It "keys in" with the pagination of Gray's Manual, seventh edition. Prof. Griggs has given this key a thorough try-out with his students at George Washington University, to iron out possible rough spots, before committing it to print.

Science News Letter, May 7, 1932

Ornithology

THE BIRD BOOK—Neltje Blanchan—*Doubleday, Doran*, 498 p., 68 colored pl., $5. This volume combines two previous publications by the author: *Bird Neighbors* and *Birds that Hunt and Are Hunted*, but with new black-and-white text drawings and colored plates. It makes a really big five dollars' worth of popular ornithology.

Science News Letter, May 7, 1932

Mathematics

BINARY LOGARITHMS—G. H. Pohland—*The author*, 24 leaves. Binary logarithms are calculated on the base 2 instead of the usual 10 or the original (Napierian) *e*, and the author states that they are valuable in determining wavelengths of the electromagnetic range, and other vibratory systems.

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Education

ROADS TO KNOWLEDGE—Ed. by A. Neilson—*Norton*, 349 p., $3.75. Here a number of specialists tell the layman how to make of his graduation from school a "commencement day" in the study of his own field of interest. Each chapter gives a brief survey of a particular field and points the way to further knowledge. Some readers will regret to find most of the physical sciences neglected.

Science News Letter, May 7, 1932

Archaeology—Ethnology

THE HISTORY OF THE MAYA—Thomas Gann and J. Eric Thompson—*Scribner*, 264 p., $2.50. What science has learned about the people who built prehistoric America's greatest civilization is summed up admirably in this volume. Dr. Gann of the British Museum gives present views regarding the origin of the Maya, and the history of the Old Empire. He has chapters also on Mayan art and architecture and the life of modern Mayan Indians of Yucatan. Chapters by Dr. Thompson of the Field Museum deal with the history of Yucatan, the calendar, religion, ceremonies, and traditions of the Maya, and their daily life. The illustrations are good.

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Geology

REPORT TO THE HOUSE OF REPRESENTATIVES ON CRUDE PETROLEUM AND ITS LIQUID REFINED PRODUCTS—U. S. Tariff Commission—*Govt. Print. Off.*, 205 p., 25c. Detailed and comprehensive statistics on the cost of production of petroleum, largely in tabular form.

Science News Letter, May 7, 1932

English

WORDS CONFUSED AND MISUSED—Maurice H. Weseen—*Crowell*, 310 p., $2. Arranged conveniently in alphabetical form. The list includes words confused because of spelling as well as because of meaning, as "Confidant-Confident-Confidante." A useful addition to those books kept on your desk.

Science News Letter, May 7, 1932

Psychiatry

DIRECTORY OF PSYCHIATRIC CLINICS IN THE UNITED STATES—Div. on Community Clinics, National Committee for Mental Hygiene—*Commonwealth Fund*, 165 p., $1. This third edition of the directory includes clinics which give service to adults only.

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Anthropology

TRIBES OF THE RIF—Carleton Stevens Coon—*Peabody Museum of Harvard University*—417 p., 67 pl. $12.50. This "Volume Nine of the Harvard African Studies" is a truly monumental work on a race of African Nordics of Morocco. The author admires these Rifs. Perhaps that is why his scientific descriptions of their life and customs still have so many vivid and appreciative touches. The text throughout is supplemented by numerous statistical tables, lists, culture maps, and photographs. A large portion of the book is devoted to the anthropometric studies which have been made with great care and completeness.

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Geology-Biology

THE EARTH AND ITS LIFE—E. E. Cureton and P. J. Rulon—*Harvard University Press*, 139 p., $1. A well-arranged compact presentation of the principal facts and concepts in geology and the life sciences, suitable for use in the first year of the junior high school

Science News Letter, May 7, 1932

Chemistry

LIST OF PERIODICALS ABSTRACTED BY CHEMICAL ABSTRACTS—*American Chemical Society*, 142 p., 50c. As a handbook which allows the location of a scientific publication in the library that happens to be geographically closest, this list should prove useful to many engaged in research. It is compiled as the result of a library canvass conducted for Chemical Abstracts by the Research Information Service of the National Research Council, under the supervision of Dr. Clarence J. West, director.

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Unnatural History

A BOOK OF DRAGONS — Alfred Leete — *Illustrated Newspapers, Ltd., London*, 100 p., 6s. A collection of entertaining pictures by a leading English humorous artist. The principal character, Dennys, Rouge Dragon of the Fiery Breath, is a small domesticated dragon who combines the best features of house-dog and self-contained heating unit.

Science News Letter, May 7, 1932

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